

101.103(d)(2)(ii). It is equally important for frequency coordination and interference protection that the same data also should be listed on the license and entered into all appropriate Commission data bases.

Supplementary information -- Pursuant to proposed Section 101.713(a), all CC applicants must, before application filing, prior coordinate the proposed frequency usage. This requirement should be deleted from Subpart I for CC applicants and should be included in Section 101.21 regarding application requirements for both CC and POFS applicants. This revision is set forth in Appendix A.¹⁷

C. Frequency Assignments Must Be Consolidated.

In the NPRM, the Commission proposes separating the POFS frequencies (Section 101.605) and the CC frequencies (Section 101.703). This demarcation is confusing and unnecessary.

Pursuant to the reallocation of the bands above 3 GHz in ET Docket 92-9, POFS and CC users share many of these frequencies. These shared frequencies are duplicated in Sections 101.605 and 101.703.

¹⁷In Section 101.713(b), the Commission would require applicants in bands shared with satellite users to submit certain documents if the calculated safety margin is less than 5 dB. This requirement should be deleted because it is no longer useful. In Section 101.713(c), the Commission would require applicants in these bands to ascertain, in advance, whether the beam of its proposed antenna(s) intersects the beam of any earth station antenna within the rain scatter coordination distance contour. TIA/NSMA propose deleting this requirement because satellite licensees do not need to make this showing and because it is quite expensive to complete.

To reflect this band sharing and to eliminate any repetition or confusion, TIA and NSMA propose consolidating all frequency assignments into a single new Section 101.147.¹⁸ This new listing sets forth all the shared bands and all the bands assigned to individual services.¹⁹

D. POFS Licensees Must Be Eligible For Temporary Authorizations.

In Sections 101.715 and 101.717, the Commission proposes that CC point-to-point microwave users are eligible for temporary authorizations. POFS users would not be given the same opportunity.

No explanation for this disparate treatment is included in the NPRM. Nor can any be provided. First, this distinction is not made with respect to grants of STA under Section 101.31, as both POFS and CC licensees are covered therein. Second, POFS licensees typically have the same need for obtaining a temporary authorization as CC licensees. Thus,

¹⁸In addition to consolidating Sections 101.605 and 101.703, TIA and NSMA recommend certain minor changes to eliminate outdated requirements. These changes include: (i) eliminating Section 101.703(b) regarding applications for new stations; and (ii) adding frequencies in the 21,200 - 22,000 MHz and 22,000 - 23,600 MHz bands.

¹⁹The 38 GHz band provides useful short-haul links for PCS backhaul networks. Earlier this year, TIA members, Harris Corporation - Farinon Division and MRC, petitioned the Commission to prevent the warehousing of 38 GHz frequency blocks vital for successful implementation of PCS in the U.S. In light of this proceeding, and considering a pending September 9, 1994, TIA petition to channelize the 37 - 38 GHz band (RM-8553), TIA and NSMA see a need to clarify the Commission policy on assigning frequencies in the 38 GHz band. In a September 1994 Public Notice, the Commission imposed certain requirements on 38 GHz applications because they had "increased substantially" and because the availability of such spectrum had to be protected. Common Carrier Bureau Established Policy Governing the Assignment of Frequencies in the 38 GHz Band and Other Bands To Be Used in Conjunction With PCS Support Communications, Public Notice, 75 Rad. Reg. (P&F) 2d 1341 (1994) ("38 GHz Band Notice"). These corrective actions should not be used as a basis for any official Commission rule on this issue. Even though the 38 GHz Band Notice may have been useful for the Commission to send a clear message to the 38 GHz user community, it discourages the use of a band which is, after all, dedicated to the successful and rapid implementation of PCS. A public consultation is needed to review the impact of the 38 GHz Band Notice and to develop a clear policy that will promote the efficient use of the key 38 GHz band.

as set forth in Appendix A, Sections 101.715 and 101.717 must be deleted, and Section 101.31 must be revised to qualify POFS and CC licensees for temporary authorizations.²⁰

E. Common Carriers Must Be Eligible For Pre-Authorization Construction Under Part 101.

Pursuant to Section 101.5(d), POFS applicants could construct, but not operate, a fixed point-to-point microwave system prior to licensing. Similar flexibility is not proposed in the NPRM for CC applicants.

The Commission decided to forego addressing this dichotomy between POFS and CC applicants in the NPRM because it did not want to duplicate the proposals made in the pending CC Docket No. 93-2, which would confer the same pre-authorization construction flexibility on CC point-to-point microwave applicants as POFS applicants enjoy.²¹ TIA and NSMA do not oppose this approach. However, if the proposals in CC Docket No. 93-2 are adopted, they should be included expressly in Part 101.

F. The Distinction Between Private and Common Carrier Users Must Be Maintained.

Streamlining and combining all the technical standards into Subpart C is essential to ensuring economical, spectrally efficient, and reliable POFS and CC point-to-point microwave services. Nevertheless, the uniqueness of the POFS and CC services must not be compromised as the result of these revisions.

²⁰Section 101.31 also must be revised to permit expedited prior written or oral coordination. Such prior notice is standard in the microwave industry and also is proposed in Section 101.103(d)(2)(vi) for permanent authorizations.

²¹NPRM at para. 11 n.11.

Each class of service has special attributes and serves different kinds of needs. Any Part 101 rule must guarantee that POFS users can continue providing customized services and meeting public safety and emergency requirements. Conversely, CC users must be assured that they can continue providing commercial service to the general public without any restrictions on how the service would be offered, where it would be provided, or how much it would cost.

TIA and NSMA recommend that Subparts H and I be retained to govern the non-technical aspects of POFS and CC operations. Specifically, Subparts H and I should include, at a minimum, non-technical rules for eligibility and permissible communications. In addition, Section 101.3 must be revised to include specific definitions for "Private Operational Fixed Point-to-Point Microwave Service" and "Common Carrier Fixed Point-to-Point Microwave Service," as there is no proposed definition covering the POFS point-to-point licensee. Similarly, Subparts H and I, respectively, should be renamed accordingly. These specific proposed revisions are set forth in Appendix A.

CERTAIN USER RELATED RULES MUST BE REVISED

TIA and NSMA generally support adoption of the Commission's proposed user-related technical rules for frequency coordination procedures (Section 101.103), interference protection criteria (Section 101.105), frequency tolerance (Section 101.107), bandwidth (Section 101.109), emission levels (Section 101.111), and microwave modulation (Section 101.141). Nevertheless, changes to these provisions must be made to improve fixed point-to-point microwave users' ability to operate in a spectrally-efficient, interference-free environment.

In addition to these technical requirements, myriad changes to non-technical user - related rules are necessary. Changes in the criteria for classifying application amendments or license modifications must be made to conform with industry standards. A transition period must be established so that all affected parties have a precise timetable for when fixed microwave licensees and equipment are subject to existing Part 21 and Part 94 requirements or to Part 101 rules. The construction period must be 18 months for POFS and CC users so that licensees have adequate scheduling flexibility and protection against delays that they could not prevent.

A. The Proposed Frequency Coordination Rules Must Be Fine-Tuned.

The Commission's proposed Section 101.103 for frequency coordination almost completely replicates TIA's proposal:

In the Second Report and Order in ET Docket 92-9, the Commission adopted the current Part 21 coordination procedures and the current Part 94 interference standards for the relocated common carrier and private operational fixed microwave users. As stated . . . in the Second Report and Order, the common carrier and private microwave industry members have united to develop joint interference standards and coordination procedures. We propose, therefore, to apply the same coordination procedures and interference standards to all bands for both private and common carrier fixed microwave services. In addition, we propose to modify the present coordination procedures and interference protection standards to be consistent with the TIA industry standards. See proposed Sections 101.103 and 101.105.²²

Accordingly, with the proposed revision discussed below regarding data required in the prior coordination notice ("PCN"), TIA and NSMA support adoption of Section 101.103.

²²NPRM at para. 16 (footnote omitted).

In the Second Report and Order, the Commission, to be consistent with current industry practices, decided that, for the 4 GHz through 11 GHz bands, it would use the Part 21 CC prior coordination procedures.²³ TIA and NSMA agree and thus support the Commission's proposal to use the prior coordination procedure, as specified in current Section 21.100, for all point-to-point microwave bands subject to Part 101.

The benefits derived from the prior coordination process were well documented in the record of ET Docket No. 92-9. Data are transmitted more expeditiously between coordinators, databases are updated quickly, and processing burdens on the Commission are reduced substantially. If the industry polices itself for interference conflicts, as is currently done under Section 21.100, the Commission can devote more resources to processing applications in a timely manner.²⁴

In addition, TIA proposed certain specific changes to Section 21.100 which conform with current industry practice. These changes appropriately have been incorporated into the proposed Part 101.103(d) provisions for frequency coordination:

²³Second Report and Order, 8 FCC Rcd at 6515-16.

²⁴For example, in the MAS band, approximately 1,200 applications were filed in 1993. Under the current system, coordination agencies engineer these systems independently, based on data received from the Commission. Applicants have up to six (6) months to file an application. The Commission then reviews each application for potential conflicts and accepts or dismisses the application. Since interference protection in this band is based upon a set distance criteria and the band is highly congested, competing applications occur frequently. Approximately 34 MAS applications in 1993 were dismissed due to mutual exclusivity with another proposal or interference conflicts with an existing system. Under this situation everyone loses. The applicant loses needed spectrum and potential revenue and the coordinating agency loses respect due to factors out of its control. With prior coordination, mutually exclusive MAS sites and interference conflicts would be identified in the engineering process, not after several months of application processing time. This process could permit the Commission to expedite license grants.

- Section (d)(1) -- This section contains three (3) necessary proposed changes. First, coordination would be required prior to filing an amendment or major modification, regardless of the nature of the change. Second, the rules are clarified to indicate that future system growth, that is to be protected from interference, must be prior coordinated. Third, an applicant no longer would be required to provide an explanation with the application if a party, with which it is coordinating, does not timely respond to a notification.
- Section (d)(2)(ii) -- The technical details that must be included in the notification are changed to make the data provided more useful. However, TIA and NSMA propose that additional changes be made to this section. These changes (which are in Appendix A) include requiring additional information concerning transmitting and receiving antennas and concerning transmission line losses.
- Section (d)(2)(iii) -- Given the emergence of digital radios in the higher bands, information regarding type of modulation and equipment operating characteristics no longer would be limited to transmitters operating below 15 GHz.
- Section (d)(2)(iv) -- Oftentimes, a response to the prior coordination notice does not contain the reasons for the problem. To assist the applicant in addressing the response, this proposed section requires the responding party to provide these reasons upon any oral notification and to submit written documentation describing any interference problem during the 30-day notification period.
- Section (d)(2)(vi) -- This new section would provide for expedited prior coordination notices of less than 30 days.
- Section (d)(2)(vii) -- This section would streamline the notification process.

Oral PCN -- PCN requirements and procedures are governed by Section 101.103(d)(2)(i). If the PCN or response thereto is oral, TIA and NSMA herein propose that Section 101.103(d)(2)(i) be revised to require that the party making the oral PCN or response provide written documentation of such communication upon request.

Growth channels -- In Section 101.103(d)(2)(xii), the Commission proposes accommodating the needs of licensees which have invested in growth channels. To protect this investment, a licensee would have six (6) months to file for the frequency or lose it to another applicant or licensee.

TIA/NSMA support protection of growth channels, but oppose the Commission's proposed approach. Under the Commission's proposal, a licensee could hold a growth frequency in reserve for a period of up to six (6) months without showing any demonstrable need for the frequency. In frequency congested areas, this rule could be used to delay, and possibly block, a competitor from providing service for a period of six (6) months. This is clearly anti-competitive and is tantamount to temporary spectrum "warehousing." Indeed, in the Second Report and Order, the Commission expresses the same concern:

[I]t is essential that valuable spectrum not lie idle. [A] reserved channel should be made available to another licensee upon a showing of need. [T]his...will permit growth channels to continue to be reserved while ensuring that the needs of all microwave licensees are met.²⁵

TIA and NSMA propose using the language currently in Section 21.100(d)(2)(xii), which permits reservation of growth channels provided that they must be released upon a showing of need, and applying it to all frequency bands subject to Part 101. Mutually exclusive applications would be subject to Section 101.45 should conflicting applications be filed at the Commission.

²⁵Second Report and Order, 8 FCC Rcd at 6517.

B. The Interference Protection Criteria Are Appropriate With Certain Minor Changes.

Adoption of Part 101 interference protection criteria is one of the most important aspects of this proceeding. In the Second Report and Order, the Commission determined that interference standards for CC and POFS licensees should be harmonized and should be administered by a single recognized standards body, such as TIA TR14.11.²⁶

The Commission's Section 101.105 generally includes TIA's proposals. Certain issues still must be clarified and revised. These issues are: (i) analog interference noise levels must be capable of being relaxed; (ii) the "practical threshold" for interference under Section 101.105(b) must be defined; and (iii) interference resolution dispute mechanisms must be prescribed. TIA and NSMA support adoption of Section 101.105, with the revisions proposed herein.²⁷

TIA's Bulletin 10-F is the benchmark industry standard for microwave interference protection. As the product of substantial and concerted effort by a broad range of industry participants, including numerous microwave equipment manufacturers, providers, and coordinators, the Bulletin 10-F criteria are the most accurate, up-to-date set of standards addressing this problem.

TIA addresses directly several issues in Bulletin 10-F that are specifically related to protecting microwave users from interference. In Bulletin 10-F, TIA revises general fixed microwave interference matters and it includes a separate annex addressing PCS-to-microwave interference based upon the Commission's new microwave channel plans adopted

²⁶Second Report and Order, 8 FCC Rcd at 6516.

²⁷See Appendix A.

in the Second Report and Order, separate requirements for short-haul microwave paths, and procedures for prior coordination notice.

Use of Bulletin 10-F -- Instead of incorporating Bulletin 10-F into the rules, the Commission proposes, in Section 101.105(c)(1), that its use be encouraged. Alternatively, if Bulletin 10-F is inappropriate, the Commission, in Section 101.105(c)(2), proposes that default standards, based upon current Section 94.63(d)(3), be applied. TIA and NSMA support this approach.

Relaxation of interference levels -- Under current Section 94.15(b)(2), if the potential interference will exceed the levels permitted under Section 94.63, the parties affected can mutually agree, in writing, to accept the higher level.²⁸ The proposed Section 101.105 does not include a comparable provision. Such flexibility will be critical in the PCS environment. Thus, TIA and NSMA propose that such language be included in Part 101.105.²⁹

Practical threshold must be defined -- In Section 101.105(b), adjacent channel interference protection criteria must not result in the "interfering signal produc[ing] more than 1.0 dB degradation of the practical threshold of the protected receiver." A definition of "practical threshold" is not proposed. The increase in local PCS licenses will make this definition important because "practical threshold," as well as grade of service, are treated differently in the fixed and mobile services, making it necessary to define how this threshold will be determined for fixed services so that fixed point-to-point microwave and mobile PCS can co-habitate. Thus, as set forth in Appendix A, TIA and NSMA recommend that the

²⁸47 C.F.R. Section 94.15(b)(2) (1990).

²⁹See Appendix A.

Commission include, in Section 101.105, the Bulletin 10-F definition for "practical threshold."³⁰

Interference dispute resolution procedures are needed -- With PCS systems coming on-line and with large numbers of 2 GHz fixed users transitioning to the bands above 3 GHz at varying speeds while PCS is being implemented, the incidence of post-coordination interference could increase significantly. It is imperative that the Commission include interference dispute resolution procedures in Part 101 to expedite disposition of these problems.

TIA and NSMA recommend that the Commission require the parties to abide by a formal dispute resolution mechanism. This mechanism should be triggered if "harmful interference" occurs.³¹ Normally, the parties involved would have the initial responsibility for resolving the dispute and the Commission would be the "last resort." Licensees experiencing the harmful interference would notify the licensee believed to be causing the problem and would provide that licensee information describing its problem and supporting its claim. The licensee causing the harmful interference would be required to respond immediately and make every reasonable effort to identify and resolve the conflict. Parties would be encouraged to resolve the interference problem prior to contacting the Commission. The text of this proposal is in Appendix A.

³⁰Alternatively, "practical threshold" can be based upon generally acceptable good engineering standards.

³¹"Harmful interference" is defined in proposed Section 101.3.

C. Frequency Tolerance Specifications Must Be Revised.

In the NPRM, the Commission omitted myriad frequency tolerance specifications which need to be added. The frequency tolerances for the 4 GHz (3,700 - 4,200 MHz), lower 6 GHz (5,925 - 6,425 MHz), and 11 GHz (10,700 - 11,700 MHz) bands are added to the table. The frequency tolerance for the 10,550 - 10,680 MHz band is changed to 0.005 percent, which is the same as the 10,700-11,700 MHz band. This change would allow radios to be designed that cover both bands. These changes are made to conform to the new rules adopted in the Second Report and Order.

The Commission, in Section 101.107(b), proposes specifications for heterodyne radios. However, it only specifies requirements for transmitters and it does not specify a maximum bandwidth. In Appendix A, TIA and NSMA correct this proposal. Heterodyne microwave radio systems require the same receiver tolerance as transmitters to achieve minimum end-to-end frequency shift (final frequency tolerance). Heterodyne operation should be restricted to wide channels (10 MHz or greater) due to inherently large frequency offset.

D. Maximum Authorized Bandwidth Must Be Specified.

In the NPRM, the Commission does not include a table specifying maximum authorized bandwidths for individual frequency bands. This is a very important table because it defines the maximum bandwidth for frequency bands with no channel plan (e.g., the 2 GHz common carrier band).

TIA and NSMA propose revising Section 101.109 to include such a table, which reflects Sections 101.607 and 101.707. There are no conflicts between the existing private and common carrier regulations, except in the 18 GHz band. Under Part 94, up to 80 MHz

channels are allowed; and under Part 21, up to 220 MHz channels are allowed. To preserve flexibility and to protect existing systems, TIA and NSMA propose the 220 MHz separation for the 18 GHz band.

E. Microwave Modulation Rules Are Too Narrow.

In Section 101.141, the Commission details its proposed digital modulation requirements. Related channel loading requirements for CC users are set forth in Section 101.721. Generally, TIA and NSMA support adoption of the modulation requirements in Section 101.141. These requirements reflect the industry trend towards sophisticated digital systems.

As detailed below, Section 101.141 must be revised so that: (i) analog channel requirements are specified; (ii) digital modulation requirements apply to frequencies below 19.7 GHz; (iii) loading frequencies apply to commercially available equipment; (iv) digital equipment is not subject to voice channel loading requirements; (v) transmitter spike requirements are deleted; and (vi) minimum payload capacity must be per polarization.³² Furthermore, Section 101.721 duplicates Section 101.141 and must be deleted.

The proposed Section 101.141 for modulation (as revised in Appendix A) merges current Sections 21.122 and 94.94 to be consistent with the Second Report and Order and to accommodate all digital bit rates in current frequency plans. This revision defines digital modulation in terms of bandwidth utilization (i.e., digital modulation occupies 50% or more

³²Section 101.141(d) addresses transmitters type accepted for use with digital modulation prior to November 1, 1974. This rule covers outdated equipment no longer in production and thus TIA and NSMA propose its deletion.

of the necessary bandwidth), while retaining the current definition separately for systems employing frequency modulation.

Digital systems are better expressed in terms of DS-1, DS-3 and STS-1:

The primary mission of transport networks used to be the carriage of voice channel information. This is no longer true today. Typical digital applications, like LANs, video, high-speed data transfer and imaging, often will use more than one DS-0 and are better expressed in terms of Mbit/s or DS-1s. Furthermore, the possibility of using 32 ADPCM or 16 ADPCM systems make any voice loading requirements irrelevant to digital networks.

As SONET becomes the new national (and international with SDH) digital hierarchy, all digital network applications will be expressed in number of DS-1s (in periphery of the SONET network) or in number of STS-1s (inside the network), not in terms of DS-0s.

The number of DS-0s cannot be used as a basis for rules since $N \times DS-0$ does not correspond to any officially recognized interface. Except for very low capacity systems (typically available in one-twelve voice channel capacity), commercially available microwave transmission equipment only will operate and transmit at $N \times DS-1$, $N \times DS-3$, or $N \times STS-1$ levels. For low, medium and high capacity systems (greater than or equal to 1 DS-1 or 24 voice channels), the necessary bandwidth calculations should be based on these recognized interfaces.

Loading of a given DS-1 may vary significantly from one end of the system to another:

Several applications of microwave radios have significant Drop/Insert requirements. Using a conventional digital multiplexer, a single DS-1 will be needed to drop and insert even a few channels in a particular site. DACCs can reduce the total number of DS-1s used

in a given system. However, DACCs or Drop/Insert channel banks, are not common in smaller size systems and when they are present in larger ones, they are not always found in all branches. In a typical microwave system used, for example, by a utility company, each DS-1 is probably loaded at an average level of approximately 60%. Consequently, it will be common, in a properly designed system, to find DS-1s that are loaded from between 30% to 100%.

Full motion digital video:

Any exception to the loading or efficiency rules must not become an opportunity to circumvent them. The proposed revision obtains more efficient channelization of frequencies used primarily for satellite entrance links, by requiring that video constitute at least 50% of the digital radio payload.

Even though Section 101.141 generally reflects the foregoing industry standards, several changes to these proposed rules are needed:³³

Eliminate Section 101.721 -- Both Section 101.141(a)(3) and 101.721 address channel loading requirements. This overlap is unnecessary. TIA and NSMA propose that all technical requirements, including channel loading standards, be in Subpart C. Moreover, proposed Section 101.721, unlike Section 101.141(a)(3), limits carriers from using additional channels unless existing capacity would shortly be exhausted and establishes the minimum number of voice channels for digital systems. These rules are not required because few new

³³The proposed Section 101.139(f) sets forth the deadline for when certain equipment employing digital modulation techniques "must meet the minimum payload capacity requirements of §101.139." This rule provision appears incorrectly to cross-reference Section 101.139, which is for transmitter authorization. Instead, this rule should cross-reference Section 101.141, which is for microwave digital modulation. See Appendix A.

analog systems are being installed today with current technology. A voice channel on a digital system can be implemented with 8 to 64 Kbits/second, making the utility of the Section 101.721 requirements unclear. Thus, Section 101.721 should be eliminated.

Modulation requirements must be revised -- In Section 101.141(a), the Commission proposes that microwave modulation requirements should be applicable only to "[m]icrowave transmitters employing digital modulation techniques and operating below 15 GHz" These restrictions are inappropriate.

First, analog equipment still could be used and analog channel requirements accordingly must exist. These analog specifications must be separate from digital standards because the technical requirements and spectrum efficiency ratings for digital and for analog are quite different (e.g., some analog systems could need more bandwidth than comparable digital systems). With regard to analog systems, the minimum number of voice channels should be specified for systems operating in a bandwidth of 10 MHz or larger. The anticipated loading should be met within five (5) years of licensing or another period, subject to reasonable projection. No loading requirement should apply for smaller bandwidth systems.

Loading requirements in summary:

| SYSTEM TYPE | CRITERIA |
|--------------------|----------------------------------|
| Analog, <10 MHz BW | No loading criteria |
| Analog, ≥10 MHz BW | Minimum number of voice channels |
| Analog, video only | No loading criteria |

Analog radios must meet the following loading requirements:

| Channel Bandwidth | Minimum loading within 5 years of licensing (voice channels)* | | | |
|-------------------|---|------------------------|----------------------|--------|
| | 4 GHz | 6 GHz (5925 - 6425) | 6 GHz (6525-6875) | 11 GHz |
| Less than 10 MHz | n/a | none | none | none |
| 10 MHz | n/a | 300 | 300 | 300 |
| 20 MHz | 900 | 600 | n/a | 600 |
| 30 MHz | n/a | 900 | n/a | 900 |
| 40 MHz | n/a | n/a | n/a | 900 |

*Analog video systems are exempt from these requirements.

In the proposal TIA previously submitted, such analog loading requirements were provided. These requirements, which are in Appendix A, must be included in Section 101.141.

Second, cutting off the loading requirements for transmitters operating below 15 GHz, instead of below 19.7 GHz, is inconsistent with industry usage. In its original proposal, TIA recommended that this cut-off value be 24 GHz. However, upon re-evaluation, TIA and NSMA have revised this value to 19.7 GHz, which more appropriately reflects the needs of microwave equipment manufacturers with existing inventory that could not meet the 24 GHz requirement.

Payload capacity must correspond to commercially available equipment -- Historically, the Commission has required users to license equipment with a capacity that is unavailable in the marketplace. Understandably, this requirement has caused significant problems for

users. Thus, in Appendix A, TIA and NSMA propose revising Section 101.141 to require that the payload capacity correspond to commercially available equipment.

Transmitter spike requirements -- Transmitters employing digital modulation techniques, under Section 101.141, must effectively eliminate carrier spikes or single frequency tones in the output signal. This requirement would eliminate use of digital radio subcarriers. There is no such limit for analog equipment. Analog FM transmitters have significant carrier spikes and subcarriers. Current frequency plans and transmitter frequency tolerance limits were developed to address this issue. In Appendix A, TIA and NSMA propose revisions to Section 101.141 which resolve this problem.

F. Changes Are Needed In Criteria For Classifying Application Amendments And License Modifications.

Amendments -- In Section 101.29(c)(1), the Commission lists the criteria for determining if an amendment is "major." Revisions must be made to the criteria involving: (i) transmitter emission (subparagraph (c)(i)(iv)), so that a major amendment is limited to an increase in emission bandwidth of more than ten (10) percent, thereby giving applicants more flexibility depending on the equipment used; and (ii) changes in transmitting antenna coordinates (subparagraph (c)(i)(v)), so that a major amendment is limited to changes of more than 5 seconds, not the proposed 10 seconds, which reflects the improved accuracy resulting from the GPS technology.³⁴

Modifications -- Changes must be made with respect to the rules for "minor" modifications. For example, Section 101.59(c)(2)(i), which involves minor modification

³⁴This change is made to conform with Section 101.59(c)(3) regarding processing of applications for facility minor modifications.

processing, must be revised to make a permissible change one which increases the antenna height 3.0 instead of the proposed 6.1 meters because it is of a magnitude that affects coordination. Similarly, Section 101.61(c)(5) is revised to reflect the "center line" of the antenna.

G. A Transition Period For Compliance With Part 101 Must Be Specified.

The Commission, in the NPRM, is silent about a transition period from Parts 21 and 94 to Part 101. This failure to propose a transition period is a serious oversight. There will be significant substantive differences between certain of the new Part 101 technical rules and the corresponding Part 21 and 94 rules. These differences include the rules governing frequency coordination, interference protection, loading standards, and antenna requirements. Thus, fixed point-to-point microwave applicants, licensees, manufacturers, and other affected parties need adequate time to adjust upon adoption of the new Part 101 requirements.³⁵

TIA and NSMA strongly recommend that the Commission specify an effective date for Part 101. All systems that are licensed and all applications (including expansions or modifications) that are pending on that effective date would be grandfathered indefinitely

³⁵In Section 101.69, the Commission sets forth the timetable for the relocation of 2 GHz fixed point-to-point microwave users to clear spectrum for PCS. The four-year voluntary and one-year mandatory negotiation periods for public safety facilities in Section 101.69(f) are incorrect. The voluntary period is three (3) years and the mandatory period is two (2) years. Redevelopment of Spectrum to Encourage Innovation In the Use of New Telecommunications Technologies, Second Memorandum Opinion and Order, ET Docket No. 92-9, 76 Rad. Reg. (P&F) 2d 1043, 1050 (1994). The text of Section 101.69(f) should be corrected accordingly.

to meet Parts 21 and 94. Any new system subject to an application filed after the effective date would be subject only to Part 101.³⁶

H. The Construction Period Must Be Increased from 12 to 18 Months.

Under Section 101.63, POFS fixed point-to-point licensees would have only 12 months from the initial grant date, and CC fixed point-to-point licensees could have until the date specified in the license, to complete construction and commence operation. By contrast, point-to-multipoint licensees in the 10.6 and 18 GHz bands would have 18 months to complete construction under Section 101.63(b).

In its initial proposal, TIA recommended adopting the 18-month construction period for all fixed point-to-point licensees currently available under Part 21 instead of the 12-month period available under Part 94. This extra time is critical because conditions beyond the licensee's control, such as adverse weather conditions, often limit the actual period for construction to a mere six (6) months. Furthermore, the proliferation of PCS licensees and the exodus of 2 GHz fixed licensees are expected to reduce substantially the availability of resources needed to complete construction in a timely manner. Reliable construction crews and engineers will be at a premium. Equipment shortages and shipping delays could result. Sites will be more difficult to locate and secure. Competition among PCS licensees, eager

³⁶The text of this proposed rule is in Appendix A. A "system" for purposes of the transition period is defined in Appendix A to include the originally licensed fixed point-to-point microwave system and any modifications to the system involving: (i) a change in antenna azimuth, antenna beam width, channel loading, emission, station location, antenna height, authorized power, authorized frequencies; (ii) construction of additional links required to complete a communications network; or (iii) operationally connecting new facilities and/or frequencies. See Public Notice, Two Gigahertz Fixed Microwave Licensing Policy (Mimeo No. 23115, released May 14, 1992).

to commence service, should exert sufficient market pressure on microwave licensees to construct promptly.

The Commission does not even address this issue in the NPRM, and no evidence exists in the record that the 18-month period under Part 21 has caused any problems. Under these circumstances, as proposed in the revised Section 101.63(a) in Appendix A, TIA and NSMA request that both POFS and CC licensees have 18 months to complete construction because the additional six (6) months is unlikely to adversely impact the public interest.

THE EQUIPMENT RELATED RULES SHOULD BE ADOPTED WITH CERTAIN REVISIONS

The proposed equipment related technical rules in Part 101 encompass several issues, including antenna standards, use of ATPC, and transmitter power. These rules substantially reflect TIA's initial proposals. However, the proposed rules need to be revised so that antenna standards, ATPC, and transmitter power levels can be effective in promoting spectral efficiency and can be consistent with industry usage.³⁷

A. Antenna Standards Must Be Revised To Include And Clarify What Stations Are Covered, How Upgrades Are Accomplished, And What Polarization Specifications Must Be Used.

Standards governing antennas always have been essential to spectrally efficient fixed microwave operation. The proliferation of PCS and other new technologies makes these standards even more important.

³⁷Under Section 101.403(b), it is unclear what equipment could be tested under a developmental authorization. TIA and NSMA propose revising this rule, as set forth in Appendix A, to ensure that all equipment used in a fixed point-to-point microwave system is eligible for such authorization.

TIA and NSMA generally support adoption of proposed Sections 101.115 and 101.117. The proposed Section 101.115 contains many of TIA's initial recommendations. In Section 101.115, the Commission incorporates TIA's proposals that the Section 21.108 provisions be used to govern operation of antennas under Part 101 and it incorporates TIA's recommended modifications to the category B standards for the upper 6 GHz band.

Changes to Sections 101.115 and 101.117 nevertheless are necessary. First, and most importantly, efforts must be made to update the Commission's 1983 definition for what constitutes a "congested area."³⁸ Second, Section 101.115 must be revised to clarify that the antenna standards therein cover all fixed stations operating at 900 MHz or above and to clarify how antenna upgrade requests must be handled. Third, Section 101.117 must be revised to reflect that use of vertical or horizontal polarization, and not circular polarization, is the industry standard.

Congested Areas -- A critical component for making these standards effective is defining when congestion exists and when a category A or B antenna should be used. In the NPRM, the Commission decides not to propose any new criteria for making this determination.

All antenna standards for Part 101 services have been consolidated into one rule section (proposed section 101.115). Few substantive changes to the antenna standards are proposed. In the Docket 92-9 proceeding, commenting parties raised concerns about our existing antenna standards, stating that the category A standards should be updated and that a new detailed definition of congested areas should be specified to maximize efficiency and permit full use of available bands. The Commission does not have sufficient information at this time to propose specific changes to these standards.³⁹

³⁸Public Notice, Private Microwave Congested Areas (Mimeo No. 4884, released June 11, 1983).

³⁹NPRM at para. 19 (footnote omitted).

Developing viable frequency "congestion" criteria is like hitting a moving target. Anticipated high volume levels of PCS and relocated 2 GHz applications will make it quite difficult, and potentially dangerous, to develop a "snap shot" of an area for purposes of determining congestion. Despite this expected frenzied pace of applications, the Commission still uses 1983 criteria for defining a congested microwave area. This antiquated set of standards no longer is appropriate.

Not only is the issue of defining what constitutes frequency congestion an important missing link in the NPRM, the mechanisms to determine the circumstances for requiring upgrades from category B to category A antennas also are crucial. This problem is especially acute for applicants which must coordinate with incumbent licensees, because the incumbents typically control what antennas can be deployed and oftentimes force the applicant to use the more costly category A antenna.

TIA and NSMA are quite interested in developing standards for defining "congestion" and for determining when antenna upgrades are required. These standards will be critical in ensuring a smooth transition to a PCS environment. Accordingly, TIA and NSMA members are willing to work with the Commission and others in the industry to develop these critical standards.

Upper 6 GHz band category B standards -- In the 6 GHz band (5925-6425 and 6525-6875), the Commission has imposed new category A and B standards to become effective June 1, 1997. The new standards appear to be a consolidation of the existing antenna standards found in Parts 21 and 94. The category A standards, which apply after June 1, 1997, are identical for the lower and upper 6 GHz bands. However, for category B

antennas, there is a lessening of the radiation suppression requirements in 1997 for the upper 6 GHz band and an increase in requirements for the lower 6 GHz band. Following the logic applied to the category A standards, the more stringent upper 6 GHz band category B standards should be imposed across the entire 6 GHz band. Thus, the discrimination values for category B in the upper 6 GHz band after June 1, 1997, should be 39 and 45 dB for 100° to 140° and 140° to 180°, respectively. The Commission corrects this discrepancy in the proposed Antenna Standards Table (Section 101.115(c)).

Antenna polarization -- Antenna cross-polarization is used increasingly in the industry. However, the proposed rules in the NPRM do not provide for such use. Microwave radio systems increase bandwidth capacity by using cross-polarization (i.e., both polarizations -- site and frequency -- are used at the same time). Permitting use of cross-polarization would result in increased spectrum efficiency by making more bandwidth available. The Commission does not define what constitutes "antenna polarization" in Section 101.117. This definition is important because polarization applications are not unlimited. Current industry usage involves only vertical or horizontal polarization. Absent a waiver, circular polarization must not be allowed. These provisions for cross-polarization and for defining permissible applications of antenna polarization are in Appendix A.

B. ATPC Must Be Permitted.

ATPC is a feature of a digital microwave radio system that adjusts the transmitter output power. ATPC allows the transmitter to operate at less than maximum power for most of the time. Guidelines for use of ATPC are set forth in TIA's Bulletin 10-F.

In the Second Report and Order, the Commission states that ATPC is permitted up to a 3 dB increase in EIRP, thereby validating its use.⁴⁰ Comsearch recommended, in ET Docket No. 92-9, that the rules be revised to include a definition of ATPC which allows for variable power operation below a transmitter's maximum authorized power. It also recommended that implementing ATPC should be left to frequency coordinators. In this regard, the Commission decided to "encourage industry groups to explore in greater detail under what circumstances ATPC should be authorized and whether a greater increase in [EIRP] than 3 dB would be appropriate."⁴¹

The guidelines sought by the Commission are prescribed in TIA's Bulletin 10-F, Section 4.3, which TIA initially proposed should be referenced in the Commission's rules. The Commission, in the NPRM, responds to this proposal:

We have reviewed the ATPC guidelines in [Bulletin] 10-F and are still uncertain of the necessity of including explicit provisions for its use in the rules. We seek comment on whether it is necessary to have TIA's recommendations for ATPC implementation included in our Rules. [Bulletin] 10-F contains provisions for up to three different power level specifications: maximum transmit power, coordinated transmit power, and nominal transmit power. We also seek comment on how these recommendations for ATPC should be implemented under our current licensing scheme, which authorizes only a single operating power level on each license, with that power being the one used in the coordination process. If the use of ATPC, as described in [Bulletin] 10-F, were to be permitted, what changes would the Commission have to make to its forms, licenses, and data base?⁴²

⁴⁰Second Report and Order, 8 FCC Rcd at 6518-6519.

⁴¹Second Report and Order, 8 FCC Rcd at 6519.

⁴²NPRM at para. 18.